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Geology of the Cape Mendocino, Eureka, Garberville, and Southwestern part of the Hayfork 30 x 60 Minute Quadrangles and Adjacent Offshore Area, Northern California

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Digital Publication and Database Description to accompany
Miscellaneous Field Studies Map MF-2336
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U.S. Department of the Interior
U.S. Geological Survey

Contents

Introduction

This pamphlet serves to introduce and describe the digital files that are included in this publication, available for downloading at http://geopubs.wr.usgs.gov. These data include both a set of Arc/Info geospatial databases containing the geologic information and Adobe Acrobat PDF and PostScript plot files containing images of the geologic map sheets and explanation sheets, as well as the accompanying text describing the geology of the area. For those solely interested in a paper plot of the map and explanation sheets, please see the section entitled "For Those Who Don't Use Digital Geologic Map Databases" below.

This digital map publication, compiled from previously published and unpublished data and new mapping by the authors, represents the general distribution of bedrock and surficial deposits in the Cape Mendocino, Eureka, Garberville, and southwestern part of the Hayfork 30 x 60 minute quadrangles and adjacent offshore area. Together with the accompanying geologic explanation pamphlet (available as ceghmf.txt, ceghmf.pdf, ceghmf.ps), it provides current information on the geologic structure and stratigraphy of the area covered. The database delineates map units that are identified by general age and lithology following the stratigraphic nomenclature of the U.S. Geological Survey. The scale of the source maps limits the spatial resolution (scale) of the database to 1:100,000 or smaller. The content and character of the digital publication, as well as methods of obtaining the digital files, are described below.

For those who don't use digital geologic map databases

For those interested in the geology of this area who do not use an ARC/INFO compatible Geographic Information System (GIS), we have provided two sets of plotfiles containing images of much of the information in the database. Each set contains an image of four geologic map sheets, two explanation sheets, and an explanatory pamphlet. There is a set of images in PostScript format and another in Adobe Acrobat PDF format (see the sections “PostScript plot files” and “PDF plot files” below).

Those interested who have computer capability can access the plot file packages in either of the two ways described below (see the section “Obtaining the digital database and plotfile packages”). However, it should be noted the plot file packages do require gzip and tar utilities to access the plot files. Therefore additional software, available free on the Internet, may be required to use the plot files (see section “Tar files”). In addition, the map and explanation sheets are large, and require large-format color plotters to produce a plot of the entire image, although smaller plotters can be used to plot portions of the images using the PDF plot files (see the sections “PostScript plot files” and “PDF plot files” below).

Those without computer capability can obtain plots of the map files through USGS Map-On-Demand service for digital geologic maps (see section “Obtaining plots from USGS”) or from an outside vendor (see section “Obtaining plots from an outside vendor”).

Also, USGS has adopted version numbers for publications, similar to that used in the computer industry. Therefore, this publication may be revised and upgraded from time to time. See the section “Revisions and version numbers” for details on this new policy.

MF-2336 digital contents

This publication includes three digital packages. The first is the PostScript Plotfile Package, which consists of PostScript plot files of four geologic maps, two explanation sheets,and a geologic description. The second is the PDF Plotfile Package, and contains the same plotfiles as the first package, but in Portable Document Format (PDF). The third is the Digital Database Package, and contains the geologic map database itself, and the supporting data, including base map coverages, map explanation files, geologic description files, and references.

Postscript plotfile package

This package contains the images described here in PostScript format (see below for more information on PostScript plot files):

ceghmap.ps	A PostScript plottable file containing an image of the entire geologic map and base map of the Cape Mendocino, Eureka, Garberville, and southwestern part of the Hayfork

quadrangles and adjacent offshore area, northern California at a scale of 1:137,000(Sheet 4).

euhamap.ps A PostScript plottable file containing an image of the geologic map and base map of the Eureka and southwestern part of the Hayfork quadrangles and adjacent offshore area at a scale of 1:100,000 (Sheet 1).

cmmap.ps A Postscript plottable file containing an image of the geologic map and base maps of the Cape Mendocino quadrangle and adjacent offshore area at a scale of 1:100,000 (Sheet 2).

gamap.ps A Postscript plottable file containing an image of the geologic map and base maps of the Garberville quadrangle at a scale of 1:100,000 (Sheet 3).

ceghexpl.ps A PostScript plottable file containing an image of the map keys, index maps and unit descriptions for the Cape Mendocino, Eureka, Garberville, and southwestern part of the Hayfork 30 x 60 minute quadrangles and adjacent offshore area, northern California (Sheet 5).

ceghexpl2.ps A PostScript plottable file containing an image of 2 cross-sections, K-feldspar locality index map, and seismicity section for the Cape Mendocino, Eureka, Garberville, and southwestern part of the Hayfork 30 x 60 minute quadrangles and adjacent offshore area, northern California (Sheet 6).

ceghmf.ps A PostScript plottable file of a report containing detailed unit descriptions and geological information, plus sources of data, and references cited.

ceghmfdb.ps A PostScript plottable file of a report describing the digital content of the publication (this pamphlet).

PDF plotfile package

This package contains the images described here in PDF format (see below for more information on PDF plot files):

ceghmap.pdf A PDF plottable file containing an image of the entire geologic map and base map of the Cape Mendocino, Eureka, Garberville, and southwestern part of the Hayfork quadrangles, and adjacent offshore area, northern California at a scale of 1:137,000 (Sheet 4).

euhamap.pdf A PDF plottable file containing an image of the geologic map and base maps of the Eureka and southwestern part of the Hayfork quadrangles and adjacent offshore area at a scale of 1:100,000 (Sheet 1).

cmmap.pdf A PDF plottable file containing an image of the geologic map and base maps of the Cape Mendocino quadrangle and adjacent offshore area at a scale of 1:100,000 (Sheet 2).

gamap.pdf A PDF plottable file containing an image of the geologic map and base maps of the Garberville quadrangle at a scale of 1:100,000 (Sheet 3).

ceghexpl.pdf A PDF plottable file containing an image of the map keys, index maps, and unit descriptions for the Cape Mendocino, Eureka, Garberville, and southwestern part of the Hayfork 30 x 60 minute quadrangles and adjacent offshore area, northern California (Sheet 5).

ceghexpl2.pdf A PDF plottable file containing an image of 2 cross-sections, K-feldspar locality index map, and seismicity section for the Cape Mendocino, Eureka, Garberville, and southwestern part of the Hayfork 30 x 60 minute quadrangles and adjacent offshore area, northern California (Sheet 6).

ceghmf.pdf	A PDF plottable file of a report containing detailed unit descriptions and geological information, plus sources of data, and references.
ceghmfdb.pdf	A PDF plottable file of a report describing the digital content of the publication (this pamphlet).

Digital database package

The database package includes geologic map database files for the Cape Mendocino, Eureka, Garberville, and southwestern part of the Hayfork 30 x 60 minute quadrangles and adjacent offshore area, northern California. The digital maps, or coverages, along with their associated INFO directory have been converted to uncompressed ARC/INFO export files. ARC export files promote ease of data handling, and are usable by some Geographic Information Systems in addition to ARC/INFO (see below for a discussion of working with export files). The ARC export files and the associated ARC/INFO coverages and directories, as well as the additional digital material included in the database, are described below:

ARC/INFO export file	Resultant Coverage	Description of Coverage
cegh-geo.e00	cegh-geo/	Faults, depositional contacts, and rock units in the Cape Mendocino, Eureka, Garberville, and southwestern part of the Hayfork quadrangles, and adjacent offshore area at a scale of 1:137,000. This coverage includes arcs, polygons, and annotation.
cm-geo.e00	cm-geo/	Faults, depositional contacts, and rock units in the Cape Mendocino quadrangle at a scale of 1:100,000. This coverage includes arcs, polygons, and annotation.
eu-geo.e00	eu-geo/	Faults, depositional contacts, and rock units in the Eureka quadrangle at a scale of 1:100,000. This coverage includes arcs, polygons, and annotation.
ga-geo.e00	ga-geo/	Faults, depositional contacts, and rock units in the Garberville quadrangle at a scale of 1:100,000. This coverage includes arcs, polygons, and annotation.
ha-geo.e00	ha-geo/	Faults, depositional contacts, and rock units in the southwestern part of the Hayfork quadrangle at a scale of 1:100,000. This coverage includes arcs, polygons, and annotation.
cegh-str.e00	cegh-str/	Strike and dip information and fold axes in the Cape Mendocino, Eureka, Garberville, and southwestern part of the Hayfork quadrangle at a scale of 1:137,000. This coverage includes arcs, polygons, and annotation.
cm-str.e00	cm-str/	Strike and dip information and fold axes in the Cape Mendocino quadrangle at a scale of 1:100,000. This coverage includes arcs, points, and annotation.
eu-str.e00	eu-str/	Strike and dip information and fold axes in the Eureka quadrangle. This coverage includes arcs, points, and annotation.
ga-str.e00	ga-str/	Strike and dip information and fold axes in the Garberville quadrangle at a scale of 1:100,000. This coverage includes arcs, points, and annotation.

cm-blks.e00	cm-blks/	Melange blocks in the Cape Mendocino quadrangle at a scale of 1:100,000. This coverage contains points only.
gar-blks.e00	gar-blks/	Melange blocks in the Garberville quadrangle at a scale of 1:100,000. This coverage contains points only.
cm-fos.e00	cm-fos/	Fossil localities in the Cape Mendocino quadrangle at a scale of 1:100,000. This coverage contains points only. **Note:** This fossil locality coverage is plotted on the map sheet (Sheet 2, plotfiles cmmap.ps or cmmap.pdf). This coverage is also plotted on the fossil locality index map at a reduced scale, see explanation sheet (Sheet 5, plotfiles ceghexpl.ps or ceghexpl.pdf).
eu-fos.e00	eu-fos/	Fossil localities in the Eureka quadrangle at a scale of 1:100,000 (Sheet 1). This coverage contains points only. **Note:** This fossil locality coverage is plotted on the map sheet (Sheet 1, plotfiles eurhaymap.ps or eurhaymap.pdf). This coverage is also plotted on the fossil locality index map at a reduced scale, see explanation sheet (Sheet 5, plotfiles ceghexpl.ps or ceghexpl.pdf).
gar-fos.e00	gar-fos/	Fossil localities in the Garberville quadrangle at a scale of 1:100,000 (Sheet 3). This coverage contains points only. **Note:** This fossil locality coverage is plotted on the map sheet (Sheet 3, plotfiles gamap.ps or gamap.pdf). This coverage is also plotted on the fossil locality index map at a reduced scale, see explanation sheet (Sheet 5, plotfiles allexpl.ps or allexpl.pdf).
cm-ksp.e00	cm-ksp/	K-feldspar localities in the Cape Mendocino quadrangle at a scale of 1:100,000. This coverage contains points only. **Note:** This K-feldspar locality coverage is not plotted on the map sheet (Sheet 2, plotfiles cmmap.ps or cmmap.pdf) because of space constraints at the map scale.
gar-ksp.e00	gar-ksp/	K-feldspar localities in the Garberville quadrangle at a scale of 1:100,000. This coverage contains points only. **Note:** This K-feldspar locality coverage is not plotted on the map sheet (Sheet 3, plotfiles gamap.ps or gamap.pdf) because of space constraints at the map scale.

The database package also includes the following ARC coverages, and files:

ARC/INFO export file	Resultant Coverage	Description of Coverage
cm-bath.e00	cm-bath/	Bathymetry contours base map for the Cape Mendocino quadrangle (from 1:100,000 scale original). This coverage contains arcs. **Note:** contour interval changes at 200 meters (see plotfiles cmmap.ps or cmmap.pdf) from 10 to 50 meters.
eu-bath.e00	eu-bath/	Bathymetry contours base map for the Eureka Quadrangle (from 1:100,000 scale original). This coverage contains arcs. **Note:**

contour interval changes at 200 meters (see plotfiles euhamap.ps or euhamap.pdf) from 10 to 50 meters.

ASCII text files, including explanatory text, ARC/INFO key files, PostScript plot files, and an ARC Macro Language file for conversion of ARC export files into ARC coverages:

ceghmf.ps	A PostScript plot file of a pamphlet containing detailed unit descriptions and geological information, plus sources of data and references cited.
ceghmfdb.ps	A PostScript plot file of a report describing the digital content of the publication (this pamphlet).
ceghmf.pdf	A PDF version of ceghmf.ps.
ceghmfdb.pdf	A PDF version of a report describing the digital content of the publication (this pamphlet).
ceghmf.txt	A text-only file containing an unformatted version of ceghmf.ps.
ceghmfdb.txt	A text-only file of a report describing the digital content of the publication (this pamphlet).
import.aml	ASCII text file in ARC Macro Language to convert ARC export files to ARC coverages in ARC/INFO.
mf2336.rev	A text-only file containing the revisions list for this report.
mf2336.met	A parsable text-only file of publication level FGDC metadata for this report.

The following supporting directory is not included in the database package, but is produced in the process of reconverting the export files into ARC coverages:

info/	INFO directory containing files supporting the databases.

Tar files

The three data packages described above are stored in tar (UNIX tape archive) files. A tar utility is required to extract the data from the tar file. This utility is included in most UNIX systems, and can be obtained for a variety of platforms free of charge over the Internet from Internet Literacy's Common Internet File Formats Webpage:

(http://www.matisse.net/files/formats.html)

The tar files have been compressed, and may be uncompressed with **gzip**, which is available free of charge over the Internet via links from the USGS Public Domain Software page:

(http://edcwww.cr.usgs.gov/doc/edchome/ndcdb/public.html)

When the tar file is uncompressed and the data is extracted from the tar file, a directory is produced that contains the data in the package as described above. The specifics of the tar files are listed below:

Name of compressed tar file	Size of compressed tar file (uncompressed)	Directory produced when extracted from tar file	Data package contained
m2336ps.tgz	64MB (1.26GB)	ceghps	PostScript Plotfile Package

m2336pdf.tgz	36.7MB (36.9MB)	ceghpdf	PDF Plotfile Package
m2336db.tgz	4.5MB (22MB)	ceghdb	Digital Database Package

PostScript plot files

For those interested in the geology of the Cape Mendocino, Eureka, Garberville, and southwestern part of the Hayfork 30 x 60 minute quadrangles who don't use an ARC/INFO compatible GIS system we have included a separate data package with eight PostScript plot files. Three contain a color plot of the geologic map database at 1:100,000 scale (Sheet 1, Sheet 2, Sheet 3, euhamap.ps, cmmap.ps, gamap.ps). The fourth contains a color map plot of the entire map area at a scale of 137,000 (Sheet 4, ceghmap.ps). The fifth contains a color plot of the map keys, index maps, and cross-sections (Sheet 5, ceghexpl.ps). The sixth contains a color map plot of 2 cross-sections in the map area, a K-feldspar locality index map, and a seismicity section of the area (Sheet 6, ceghexpl2.ps). Small units have not been labeled with leaders and in some instances map features or annotation overlap. Sample plots by the authors have proven to be quite legible and useful, however. In addition, a seventh PostScript file containing the geologic description and discussion is provided (ceghmf.ps), and an eighth containing the digital database description (ceghmfdb.ps, this document).

The PostScript image of the geologic maps (Sheets 1, 2, 3, 4) and map explanations (Sheets 5 and 6) are up to 52 inches wide by 35 inches high, so it requires a large plotter to produce paper copies at the intended scale. In addition, some plotters, such as those with continual paper feed from a roll, are oriented with the long axis in the vertical direction, so the PostScript image will have to be rotated 90 degrees to fit entirely onto the page. Some plotters and plotter drivers, as well as many graphics software packages, can perform this rotation. The geologic description and database description are both on 8.5 by 11 inch pages.

The PostScript plotfiles for maps were produced by the ‘postscript’ command with compression set to zero in ARC/INFO version 7.2.1. The PostScript plotfiles for pamphlets were produced in Microsoft Word 6.0 using the Destination PostScript File option from the Print command.

PDF plot files

We have also included a second digital package containing PDF versions of the PostScript map sheets and pamphlet described above. Adobe Acrobat PDF (Portable Document Format) files are similar to PostScript plot files in that they contain all the information needed to produce a paper copy of a map or pamphlet and they are platform independent. Their principal advantage is that they require less memory to store and are therefore quicker to download from the Internet. In addition, PDF files allow for relatively easy printing of portions of a map image on a printer smaller than that required to print the entire map without the purchase of expensive additional software. All PDF files in this report have been created from PostScript plot files using Adobe Acrobat Distiller. In test plots we have found that paper maps created with PDF files contain almost all the detail of maps created with PostScript plot files. We would, however, recommend that those users with the capability to print the large PostScript plot files use them in preference to the PDF files.

To use PDF files, the user must get and install a copy of Adobe Acrobat Reader. This software is available free from the Adobe website (http://www.adobe.com). Please follow the instructions given at the website to download and install this software. Once installed, the Acrobat Reader software contains an on-line manual and tutorial.

There are two ways to use Acrobat Reader in conjunction with the Internet. One is to use the PDF reader plug-in with your Internet browser. This allows for interactive viewing of PDF file images within your browser. This is a very handy way to quickly look at PDF files without downloading them to your hard disk. The second way is to download the PDF file to your local hard disk, and then view the file with Acrobat Reader. We strongly recommend that large map images be handled by downloading to your hard disk, because viewing them within an Internet browser tends to be very slow.

To print a smaller portion of a PDF map image using Acrobat Reader, it is necessary to cut out the portion desired using Acrobat Reader and the standard cut and paste tools for your platform, and then to paste the portion of the image into a file generated by another software program that can handle images. Most word processors (such as Microsoft Word) will suffice. The new file can then be printed. Image conversion in the cut and paste process, as well as changes in the scale of the map image, may result in loss of image quality. However, test plots have proven adequate. Software designed to handle images (PhotoShop, Illustrator) does a better job.

Obtaining the Digital Database and Plotfile Packages

The digital data can be obtained in either of two ways:

a. From the USGS Western Region Publications Group Web Page.
b. Sending a tape with request

To obtain tar files of database or plotfile packages from the USGS web pages:

The U.S. Geological Survey supports a set of graphical pages on the World Wide Web. Digital publications (including this one) can be accessed via these pages. The location of the main Web page for the entire USGS is

http://www.usgs.gov

The Web server for digital publications from the Western Region is

http://geopubs.wr.usgs.gov

Go to

http://geopubs.wr.usgs.gov/map-mf/mf2336

to access this publication. Besides providing easy access to the entire digital database, this Web page also affords easy access to the PostScript plot files for those who do not use digital databases (see below).

To obtain tar files of database or plotfile packages on tape:

The digital database package, including database files, PostScript plotfiles, and related files can be obtained by sending a tape with request and return address to:

Cape Men., Eureka, Garb. & SW Hayfork 30 x 60 minute quadrangles geologic database
c/o Database Coordinator
U.S. Geological Survey
345 Middlefield Road, M/S 975
Menlo Park, CA 94025

Do not omit any part of this address!

Copies of either the PostScript or PDF plot-file packages can also be obtained by sending a tape with request and return address to:

Cape Men., Eureka, Garb. & SW Hayfork 30 x 60 minute quadrangles geologic database
c/o Database Coordinator
U.S. Geological Survey
345 Middlefield Road, M/S 975
Menlo Park, CA 94025

Do not omit any part of this address!

NOTE: Be sure to include with your request the exact names, as listed above, of the tar files you require. A report number is not sufficient.

The compressed tar file will be returned on the tape. The acceptable tape types are:

2.3 or 5.0 GB, 8 mm Exabyte tape.

Obtaining plots from a commercial vendor

Those interested in the Geologic map of the Cape Mendocino, Eureka, Garberville and southwestern part of the Hayfork 30 x 60 minute quadrangles and adjacent offshore area, northern California , but who use neither a computer nor the Internet, can still obtain the information. We will provide the PostScript or PDF plot files on digital tape for use by commercial vendors who can make large-format plots. Make sure your vendor is capable of reading Exabyte tape types and PostScript or PDF plot files. Important information regarding tape file format is included in the sections "Tar files," "PostScript plot files," and "PDF plot files" above, so be certain to provide a copy of this document to your vendor.

Obtaining plots from USGS

U.S. Geological Survey provides a map-on-demand service for certain map plot-files, such as those described in this report. To obtain plots of the Geologic map of the Cape Mendocino, Eureka, Garberville and southwestern part of the Hayfork 30 x 60 minute quadrangles and adjacent offshore area, northern California, the accompanying explanation sheet, and this pamphlet, contact:

USGS Information Services
Box 25286
Denver Federal Center
Denver, CO 80225-0046

(303) 202-4200

FAX: (303) 202-4695
e-mail: infoservices@usgs.gov

Revisions and version numbers

From time to time, new information and mapping, or other improvements, will be integrated into this publication. Rather than releasing an entirely new publication, the USGS has adopted a policy of using version numbers similar to that used in the computer industry. The original version of all publications will be labeled Version 1.0. Subsequent small revisions will be denoted by the increase of the numeral after the decimal, while large changes will be denoted by increasing the numeral before the decimal. Pamphlets and map products will be clearly marked with the appropriate version number. Information about the changes, if any, that have been made since the release of Version 1.0 will be listed in the publication revision file. This file will be available at the publication web site (see above), and will also be included in the digital database package. A simplified version of the revision list will be included in the publication metadata.

Digital database format

The databases in this report were compiled in ARC/INFO, a commercial Geographic Information System (Environmental Systems Research Institute, Redlands, California), with version 3.0 of the menu interface ALACARTE (Fitzgibbon and Wentworth, 1991; Fitzgibbon, 1991; Wentworth and Fitzgibbon, 1991). The files are in either GRID (ARC/INFO raster data) format or COVERAGE (ARC/INFO vector data) format. Coverages are stored in uncompressed ARC export format (ARC/INFO version 7.x). ARC/INFO export files (files with the .e00 extension) can be converted into ARC/INFO coverages in ARC/INFO (see below) and can be read by some other Geographic Information Systems, such as MapInfo via ArcLink and ESRI's ArcView (version 1.0 for Windows 3.1 to 3.11 is available for free from ESRI's web site: http://www.esri.com). The digital compilation was done in version 7.2.1 of ARC/INFO with version 3.0 of the menu interface ALACARTE (Fitzgibbon and Wentworth, 1991; Fitzgibbon, 1991; Wentworth and Fitzgibbon, 1991).

Converting ARC export files

ARC export files are converted to ARC coverages using the ARC command IMPORT with the option COVER. To ease conversion and maintain naming conventions, we have included an ASCII text file in ARC Macro Language that will convert all of the export files in the database into coverages and create the associated INFO directory. From the ARC command line

type:

Arc: &run import.aml

ARC export files can also be read by some other Geographic Information Systems. Please consult your GIS documentation to see if you can use ARC export files and the procedure to import them.

Digital compilation

The geologic map information was digitized from stable originals of the geologic maps at 1:100,000 scale. The author manuscripts (pencil on mylar) were scanned using a Altek monochrome scanner with a resolution of 800 pixels per inch. The scanned images were vectorized and transformed from scanner coordinates to projection coordinates with digital tics placed by hand at quadrangle corners. The scanned lines were edited interactively by hand using ALACARTE, and color boundaries were tagged as appropriate, and some scanning artifacts visible at 1:24,000 were removed.

Base maps

Base map layers were prepared by downloading digital raster graphic (DRG) images of the U.S. Geological Survey Cape Mendocino (1989 edition), Eureka (1987 edition), Garberville (1979 edition), and Hayfork (1978 edition) 30 x 60 minute topographic maps from www.gisdatadepot.com. All base maps have a 50 meter contour interval. The bathymetric base maps are from Coast and Geodetic Survey hyrographic chart 1308 N-12, 1969. Please note the change from a 10 m contour interval up to 200 m to 50 m interval from 200 m to maximum depth. Scanned and vectorized bathymetric images were transformed from scanner coordinates to projection coordinates with digital tics placed by hand at map corners. All images were then trimmed interactively by hand using ALACARTE to conform to the area of the geologic coverages. Small mismatches at the boundaries caused by slight differences in the original scans remain in the three base map coverages. These base map layers are digital images but no information other than location is attached to the lines. The base maps are provided for reference only.

Faults and landslides

This map is intended to be of general use to engineers and land-use planners. However, its small scale does not provide sufficient detail for site development purposes. In addition, this map does not take the place of fault-rupture hazard zones designated by the California State Geologist (Hart and Bryant, 1997). Similarly, the database cannot be used to identify or delineate landslides in the region.

Spatial resolution

Uses of this digital geologic map should not violate the spatial resolution of the data. Although the digital form of the data removes the constraint imposed by the scale of a paper map, the detail and accuracy inherent in map scale are also present in the digital data. The fact that this database was edited at a scale of 1:100,000 means that higher resolution information is not present in the dataset. Plotting at scales larger than 1:100,000 will not yield greater real detail, although it may reveal fine-scale irregularities below the intended resolution of the database. Similarly, where this database is used in combination with other data of higher resolution, the resolution of the combined output will be limited by the lowest resolution of these data.

Database specifics

What follows is a brief and simple description of the databases included in this report and the data in them. For a comprehensive look at the database structure and content, please see the FGDC Metadata file, mf2336.met, included in the database package and available separately at the publication web page.

The map databases consist of ARC coverages and supporting INFO files, which are stored in a UTM (Universal Transverse Mercator) projection (Table 1). Digital tics define a 2.5-minute grid of latitude and longitude in the geologic coverages corresponding with quadrangle corners and internal tics. In the base map layers, the tics define a 7.5-minute grid, corresponding with quadrangle corners.

Table 1. Map Projection

The maps are stored in UTM projection. The following is an annotated projection file of the type used in Arc/Info.

PROJECTION UTM
UNITS METERS
ZONE 10 (UTM zone)
SPHEROID CLARKE1866 (Arc/Info default)
PARAMETERS
END

The content of the geologic database can be described in terms of the lines and the areas that compose the map. Descriptions of the database fields use the terms explained in Table 2.

Table 2. Field Definition Terms

ITEM NAME	name of the database field (item)
WIDTH	maximum number of digits or characters stored
OUTPUT	output width
TYPE	B-binary integer, F-binary floating point number, I-ASCII integer, C-ASCII character string, N-number with decimal places
N. DEC.	number of decimal places maintained for floating point numbers

Lines

The lines (arcs) are recorded as strings of vectors and are described in the arc attribute table (the format of the arc attribute table is shown in Table 3). They define the boundaries of the map units, the boundaries of open bodies of water, and the map boundaries. These distinctions, including the geologic identities of the unit boundaries, are recorded in the LTYPE field according to the line types listed in Table 4.

Table 3. Content of the Arc Attribute Tables

ITEM NAME	WIDTH	OUTPUT	TYPE	N. DEC	
FNODE#	4	5	B		starting node of arc (from node)
TNODE#	4	5	B		ending node of arc (to node)
LPOLY#	4	5	B		polygon to the left of the arc
RPOLY#	4	5	B		polygon to the right of the arc
LENGTH	4	12	F	3	length of arc in meters
<coverage>#	4	5	B		unique internal control number
<coverage>-ID	4	5	B		unique identification number
LTYPE	35	35	C		line type (see Table 4)

Table 4. Line Types Recorded in the LTYPE Field

cegh-geo, cm-geo, eu-geo, ga-geo, ha-geo	cegh-str, cm-str, eu-str, ga-str, ha-str, cm-bath, eu-bath
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contact, certain	f.a., anticline, certain
contact, concealed	f.a., anticline, inferred, queried
contact, approx. located	f.a., anticline, approx. located
contact, inferred	f.a., syncline, certain
contact, inferred, queried	f.a., syncline, approx. located
fault, certain	f.a., syncline, inferred, queried
fault, concealed	f.a., ot syncline, certain
fault, concealed, queried	f.a., ot syncline, approx. located
fault, approx. located	f.a., anticline, certain_s
fault, inferred	f.a., anticline, approx. located_s
fault, inferred, queried	f.a., syncline, certain_s

reverse fault, certain
reverse fault, approx. located
reverse fault, concealed
normal fault, certain
normal fault, inferred, queried
photo lineament
scratch boundary
water boundary,
water boundary, certain
map boundary
s.s. fault, r.l., certain
s.s. fault, r.l., approx. located
s.s. fault, r.l., concealed
s.s. fault, r.l., inferred, queried
thrust fault, certain
thrust fault, approx. located
thrust fault, concealed
thrust fault, concealed, queried
thrust fault, inferred
thrust fault, inferred, queried
thrust fault, inferred, queried_
1906
1906, inferred, queried
f.a., syncline, approx. located_s
bathymetric contour

The geologic line types are ALACARTE line types that correlate with the geologic line symbols in the ALACARTE line set GEOLOGY.LIN according to the ALACARTE lines lookup table. For more information about these line types, as well as information about the line types in the supporting coverages, please see the publication metadata. **Note:** This is a complete list of line types contained in the database. Not every line type is present in every coverage.

Areas

Map units (polygons) are described in the polygon attribute table (the format of the polygon attribute table is shown in Table 5). The identities of the map units from compilation sources are recorded in the PTYPE field by map label (Table 6). Map units are described more fully in the accompanying text file ceghmf.ps or ceghmf.pdf. Note that ARC/INFO coverages cannot contain both point and polygon information, so only coverages with polygon information will have a polygon attribute table, and these coverages will not have a point attribute table. For more information about these polygon types, as well as information about the polygon types in the supporting coverages, please see the publication metadata.

Table 5. Content of the Polygon Attribute Tables

ITEM NAME	WIDTH	OUTPUT	TYPE	N. DEC	
AREA	4	12	F	3	area of polygon in square meters
PERIMETER	4	12	F	3	length of perimeter in meters
<coverage>#	4	5	B		unique internal control number
<coverage>-ID	4	5	B		unique identification number
PTYPE	35	35	C		unit label

Table 6. Map unit labels recorded in the PTYPE field in coverages cegh-geo, cm-geo, eu-geo, ga-geo, and ha-geo (See the geologic explanation pamphlet for complete descriptions of units).

Krp	Qls	b?
Ks	Qm	blank
QTog	Qt	bs
QTw	Ti	bs?
QTw?	Ycgl	c
Qal	b	cb1

cb1?	ecsp	rcum
cb2	ecsp?	sp
cb2?	eh	sp?
cc	ehls	srpd
cfs	ehsp	srgb
chr	fc	srs
cls	fc?	srv
cm1	gs	water
cm1?	gs?	whji
cm2	krb	whu
cm2?	krc	whwg
co1	krk1	whwp
co2	krk2	y1
co3	krk3	y1?
co4	krl	y2
cob	m	y3
cols	mb	yb
cwr	mv	yb?
cwr?	ppsm	ybc
dpb	ppv	ybc?
dpd	rcc	ybd
dpd?	rcic	ybh
dpms	rcic?	ybh?
dpsp	rcis	ybi
dpsp?	rcls	ybi?
dpt	rcm	ybt?
ecg	rcp	
ecms	rcpd	

Note: This is a complete list of polygon types contained in the database. Not every polygon type is present in every coverage.

Points

Data gathered at a single locality (points) are described in the point attribute table (the format of the point attribute table is shown in Table 7). The identities of the points from compilation sources are recorded in the PTTYPE field (Table 8). Additional information about the points is stored in additional attribute fields as described below and in Table 7. The BKTYPE field has a value of either bs, ch, sp, or gs representing blueschist, chert, serpentinite, or greenstone respectively. The KSPAR and SAMPNO fields have a range of 0-100, and 1-81 respectively. Note that ARC/INFO coverages cannot contain both point and polygon information, so only coverages with point information will have a point attribute table, and these coverages will not have a polygon attribute table. For more information about these point types, as well as information about the point types in the supporting coverages, please see the publication metadata.

Table 7. Content of the Point Attribute Tables

ITEM NAME	WIDTH	OUTPUT	TYPE	N. DEC	
AREA	4	12	F	3	area of polygon in square meters
PERIMETER	4	12	F	3	length of perimeter in meters
<coverage>#	4	5	B		unique internal control number
<coverage>-ID	4	5	B		unique identification number
PTTYPE	35	35	C		unit label
DIP	3	3	I		dip of bedding or foliation (structure coverage only)
STRIKE	3	3	I		strike of bedding or foliation (structure coverage only)

BKTYPE	6	6	C		melange block type(melange block coverage only)
KSPAR	5	5	N	1	percentage K-feldspar. **Note:** value of 0.01 in database represents a trace amount. (K-feldspar coverage only)
SAMPNO	35	35	C		sample number(fossil coverage only)

Table 8. Point types recorded in the PTTYPE field in coverages, cegh-str, cm-str, eu-str, ga-str, and ha-str.

approx. bedding
bedding
bedding w/tops
ot bedding w/tops
foliation
ot bedding
vert bedding
vert bedding w/tops
vert foliation
inclined cleavage
horz foliation
joint

Note; This is a complete list of point types contained in the database. Not every point type is present in every coverage. The range of BKTYPE database item is either sp, ch, gs, or bs for serpentinite, chert, greenstone, or blueschist, respectively. The range of SAMPNO database item is from 1 to 81.
The geologic point types in the structure coverage are ALACARTE point types that correlate with the geologic point symbols in the ALACARTE point set GEOLOGY.MRK according to the ALACARTE point lookup table. For more information on ALACARTE and its pointsets, see Wentworth and Fitzgibbon (1991).

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